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Non Invasive Imaging (Echocardiography, Nuclear, PET, MR and CT)

DETERMINATION OF QUANTITATIVE POST-SYSTOLIC STRAIN INDEX THRESHOLD ASSESSED BY TWO-DIMENSIONAL SPECKLE TRACKING ECHOCARDIOGRAPHY FOR DETECTION OF MYOCARDIAL ISCHEMIC SEGMENTS CONFIRMED ON INVASIVE FRACTIONAL FLOW RESERVE

Poster Contributions

Poster Hall B1

Sunday, March 15, 2015, 9:45 a.m.-10:30 a.m.

Session Title: Non Invasive Imaging: Strain Imaging by Echocardiography

Abstract Category: 17. Non Invasive Imaging: Echo

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Background: Post-systolic shortening (PSS) is myocardial contraction after aortic valve closure and has been proposed as a marker of myocardial ischemia, but its diagnosis is subjective. We determined quantitative threshold of post-systolic strain index (PSI) as a parameter of PSS assessed by 2D speckle tracking transthoracic echocardiogram (TTE) for detection of left ventricular (LV) myocardial ischemic segments assessed by invasive fractional flow reserve (FFR).

Methods: Thirty-four patients (29 male, mean 64.9 ± 12.5 years) with 40 coronary arteries with $\geq 50\%$ stenosis underwent invasive FFR measurements and TTE within 36 days without clinical incident. Apical 4-, 2-, 3-chamber views for longitudinal strain were acquired via TTE; LV segment longitudinal strain thought to be supplied by the coronary vessels was calculated. PSI (%) was calculated as in Figure.

Results: We identified FFR 0.80 in 14 segments. To identify LV segments \pm FFR < 0.75 , the PSI ROC curve had an AUC of 0.632 and best cutoff point of 6% (sensitivity 86.7%, specificity 48%) to distinguish LV segments \pm FFR < 0.75 . To identify LV segments \pm FFR ≤ 0.80 , the PSI ROC curve had an AUC of 0.606 and best cutoff point of 12.5% (sensitivity 64.3%, specificity 69.2%).

Conclusion: In stable coronary artery disease subjects with $\geq 50\%$ coronary artery stenosis, PSI could identify LV segments with FFR < 0.75 and ≥ 0.75 and those with FFR ≤ 0.80 and > 0.80 , with thresholds of 6% and 12.5%, respectively.

